OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **LAKE WINONA** the program coordinators recommend the following actions.

FIGURE INTERPRETATION

- Figure 1: These graphs illustrate concentrations of chlorophyll-a in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The historical data (the bottom graph) show a *fairly stable* in-lake chlorophyll-a trend. Chlorophyll concentration increased this season most likely as a result of the slight increase in phosphorus concentration. The chlorophyll-a concentration remained relatively consistent throughout the summer. Mean chlorophyll concentration has remained below the NH mean reference line since 1988! While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are internal and external sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.

- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The lower graph shows a *slightly worsening* trend in lake transparency. Water clarity increased as the summer progressed. Low transparency readings in June may have been caused by pine pollen in the lake. All readings were above the mean for NH lakes. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.

- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake) and the hypolimnion (the lower layer); the inset graphs show current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters.

Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show a *fairly stable* trend for in-lake phosphorus levels. The epilimnetic phosphorus concentration remained low this season, and the increase in rainfall did not seem to flush excess nutrients into the lake. The concentration peaked in August but decreased in September. Hypolimnetic phosphorus concentration increased this season. Most of the samples were slightly turbid, and could have been contaminated with bottom sediment, which will raise phosphorus concentrations. Dissolved oxygen is also beginning to be depleted on the bottom of the lake and as oxygen falls below 1.0 mg/L, phosphorus normally bound to the sediment is released into the water column raising hypolimnetic phosphorus concentrations. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the VLAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

OTHER COMMENTS

- **Please note** phosphorus levels were recorded as less than 5 µg/L for Heights Brook in June (Table 8). In July, phosphorus concentrations were less than 5 ìg/L in the epilimnion, Heights Brook, and the Outlet. In September, levels were also less than 5 ìg/L in the epilimnion. The NHDES Laboratory Services adopted a new method of reporting total phosphorus this year and the lowest value that can be recorded is 'less than 5 µg/L'. We would like to remind the association that a reading of 5 µg/L is considered low for New Hampshire's waters.

- Heights Brook was a new site tested this season. Overall, results look good for the Inlet! Continued testing will enable us to identify and control sources of pollution if they become present.

- Phosphorus (Table 8) and conductivity (Table 6) were elevated in the North Inlet in September this season. This was most likely due to low flow conditions. The turbidity of the sample was high indicating that the sample contained debris. The debris often has phosphorus bound to it, which can increase phosphorus concentration. The low flow conditions also cause nutrients to accumulate in the Inlet, which can increase conductivity.

- Phosphorus concentration (Table 8) in Hawkins Pond Inlet was the lowest ever since Lake Winona joined the VLAP program in 1987! We are very pleased to see this decrease, and hope that it continues in the future.

- The process of decomposition in the sediments depletes dissolved oxygen on the bottom of thermally stratified lakes. As bacteria break down organic matter, they deplete oxygen in the water. When oxygen gets below 1 mg/L, phosphorus normally bound up in the sediments may be released into the water column, a process that is referred to as *internal loading*. Depleted oxygen in the hypolimnion usually occurs as the summer progresses. Dissolved oxygen was depleted in the last meter of the lake in July, and approaching the critical level of 1.0 mg/L two meters off the bottom. We recommend scheduling the annual lake visit in August next season so we can determine if oxygen is depleted further up through the water column. This explains the higher phosphorus in the hypolimnion (lower water layer) versus the epilimnion (upper layer). Since an internal source of phosphorus to the lake is present, limiting or eliminating external phosphorus sources in the lake's watershed is even more important for lake protection.

- Thanks to your diligent monitoring efforts, plant samples were identified on two occasions this season. None of the plants pose a threat to the lake and are a healthy part of the lake ecosystem. They also provide habitat and shelter to a variety of organisms. We encourage volunteers to continue to bring in samples and if there is concern about a plant found in the lake please contact Amy Smagula, Exotic Species Coordinator, at 271-2248.

NOTES

- Monitor's Note (6/22/00): Much pollen in lake. High winds prior to taking samples. No boat traffic today. Sampled new site: Winona Heights Stream inlet.

- Monitor's Note (7/14/00): Beaver activity north end of lake (inlet). Removed dam on Tuesday. Much less vegetation than usual (particularly north end).

- Biologist's Note (7/14/00): Weeds identified as *Vallisneria* (tape grass), *Sparganium* (bur reed), *Lobelia dortmanna* (water lobelia).

- Monitor's Note (8/22/00): Pair of loons on lake. Have been 5 loons of late. A few clouds of algae seen. Most abundant weed now is pipewort, with pickerelweed and white lilies.

- Biologist's Note (8/22/00): Plants identified as *Nitella* (algae) and Quillwort, the growth seen on the bottom of the lake.

- Monitor's Note (9/20/00): Tributary flow slow. Rain night before sampling. North Inlet beaver dam has been open for days. Few clouds of green algae at end of Hawkins Pond Inlet. A lot of ducks

have been staying around the pond Inlet for quite a while. One adult and three yearling loons on the lake.

USEFUL RESOURCES

Aquatic Plants and Their Role in Lake Ecology, WD-BB-44, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Through the Looking Glass: A Field Guide to Aquatic Plants. North American Lake Management Society, 1988. (608) 233-2836 or www.nalms.org

Stormwater Management and Erosion and Sediment Control Handbook. NHDES, Rockingham County Conservation District, USDA Natural Resource Conservation Service, 1992. (603) 679-2790.

Beavers and Their Control. UNH Cooperative Extension/NH Fish and Game, 1990. (603) 862-2346, or ceinfo.unh.edu

The Watershed Guide to Cleaner Rivers, Lakes, and Streams, Connecticut River Joint Commissions, 1995. (603) 826-4800

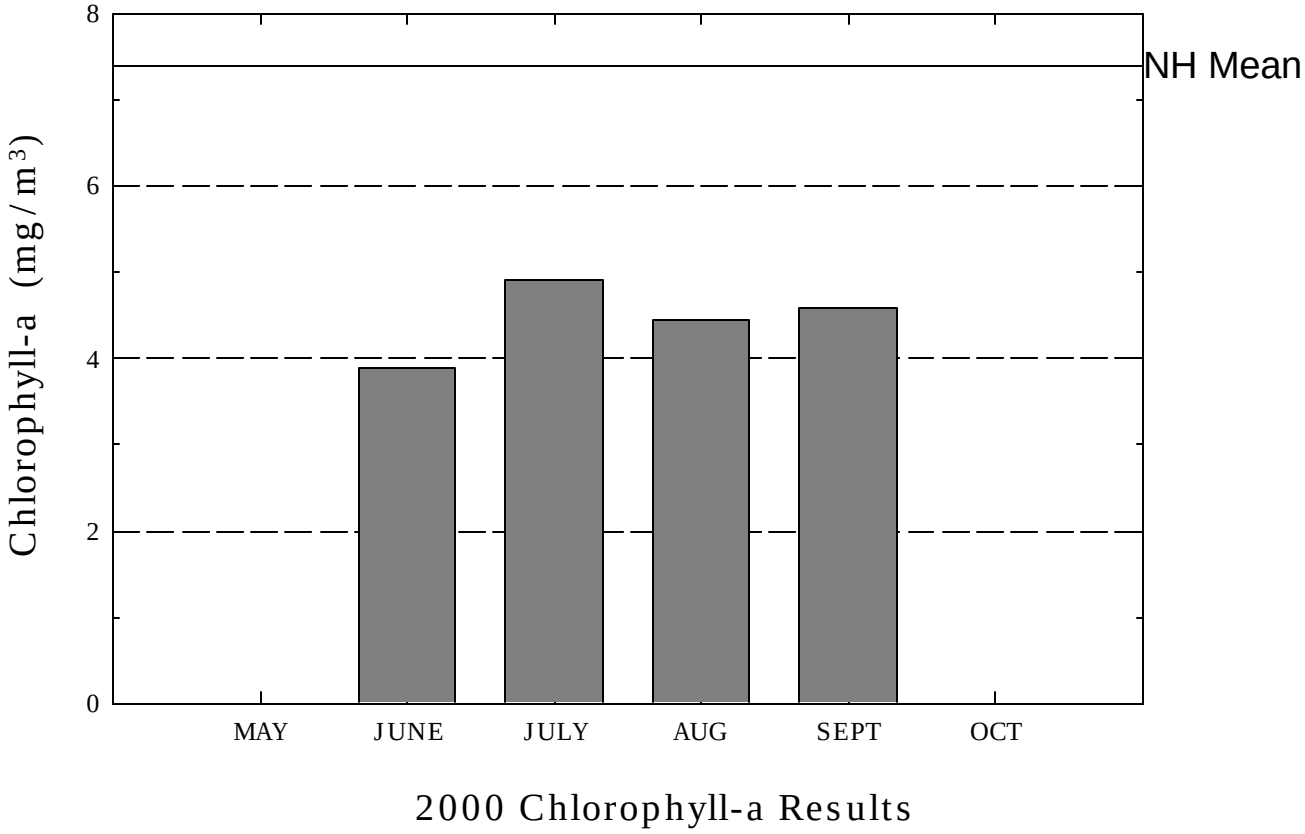
Lake Smarts: The First Lake Maintenance Handbook, A Do-It-Yourself Guide to Solving Lake Problems. The Terrene Institute. (800) 726-5253, or www.terrene.org

Effects of Phosphorus on New Hampshire's Lakes, NH Lakes Association pamphlet, (603) 226-0299 or www.nhlakes.org

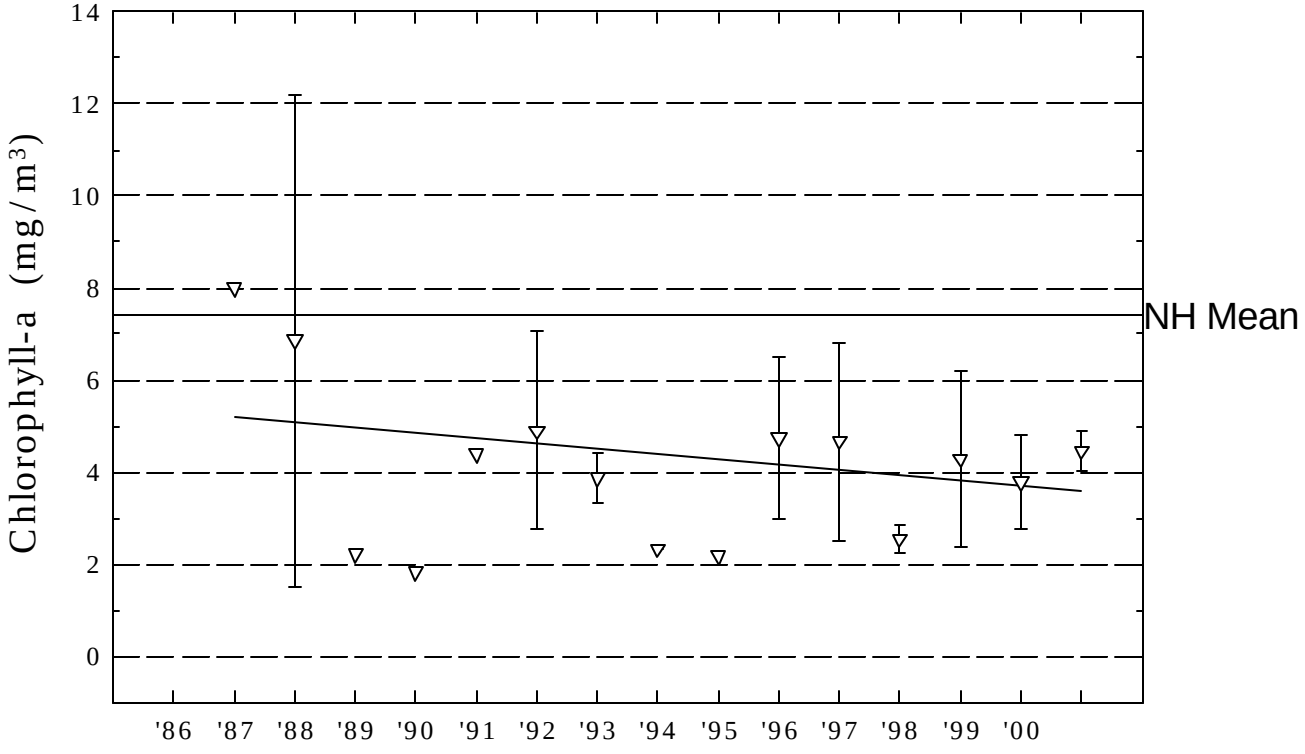
Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes, WD-BB-9, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Lake Winona

Figure 1. Monthly and Historical Chlorophyll-a Results



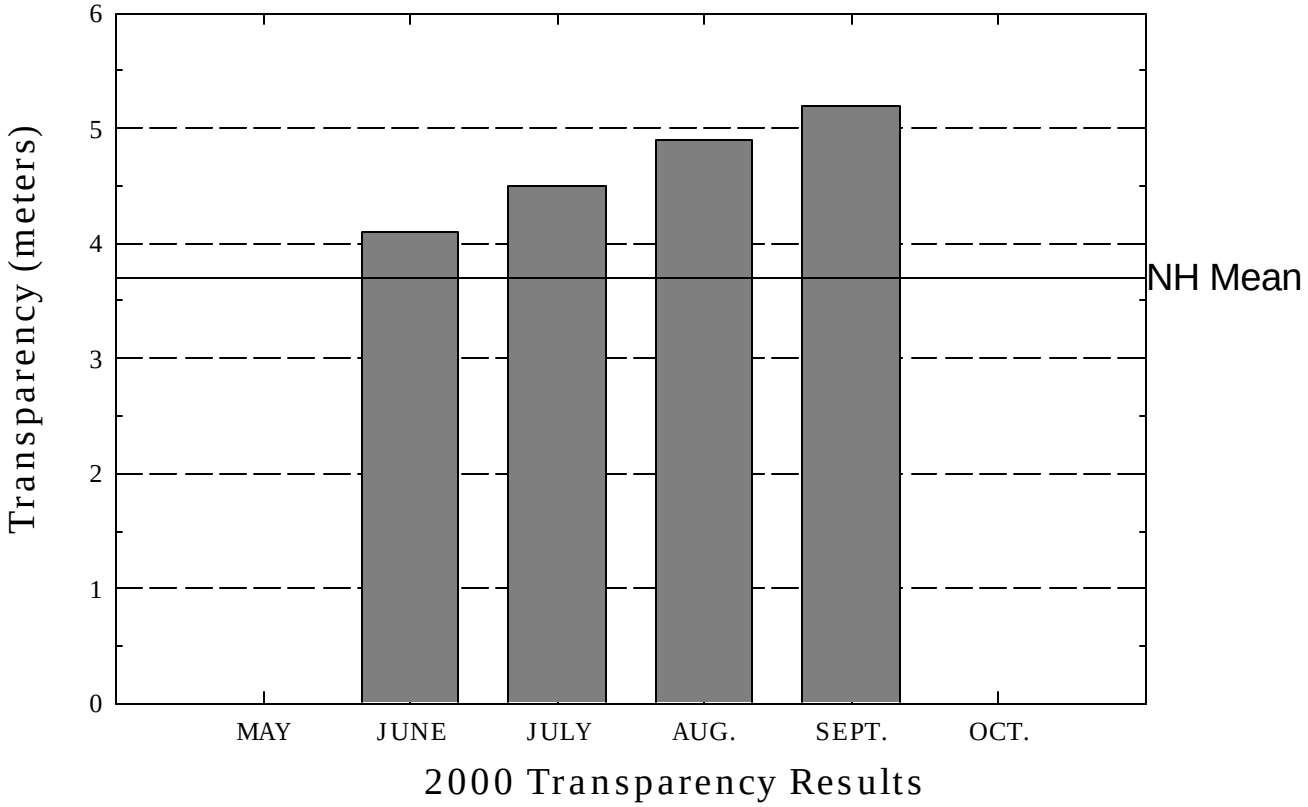
2000 Chlorophyll-a Results

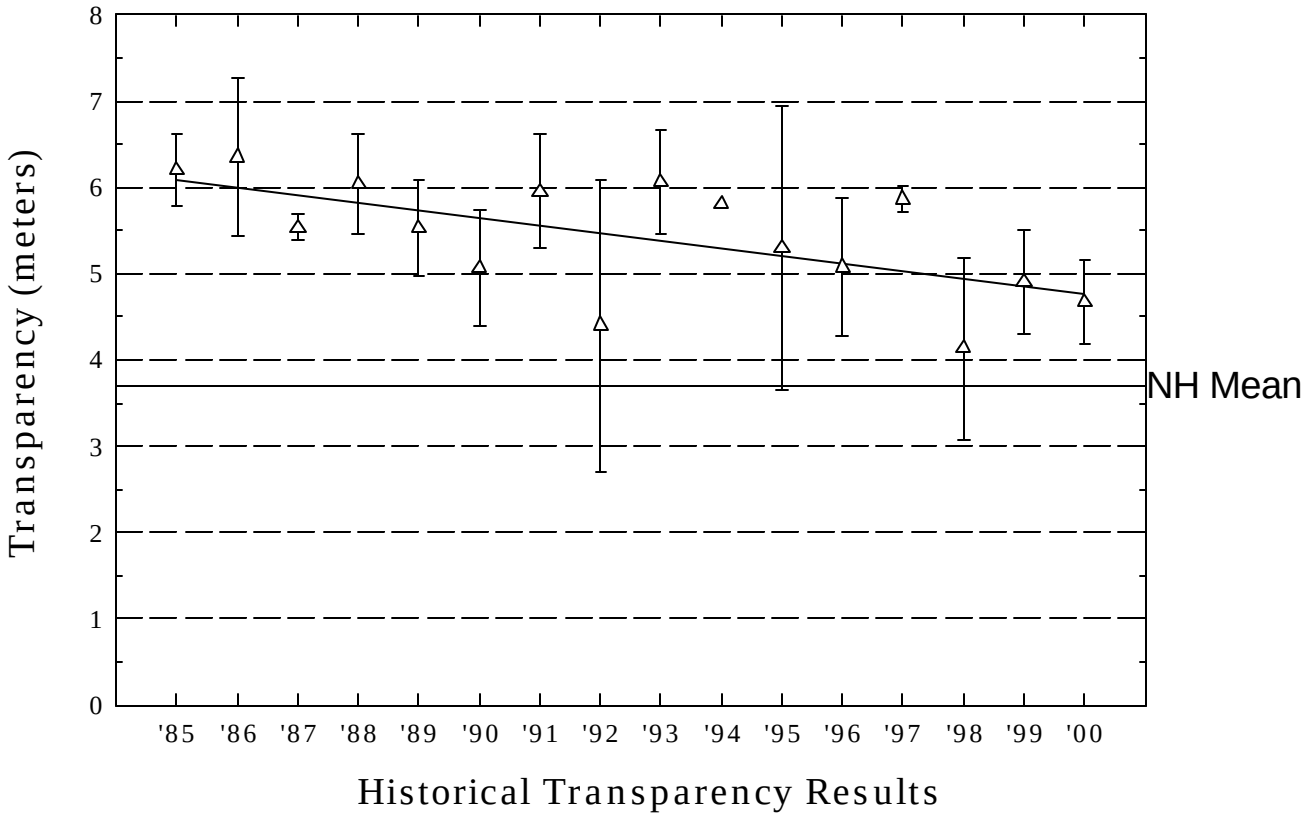


Historical Chlorophyll-a Results

Lake Winona

Figure 2. Monthly and Historical Transparency Results





Lake Winona

Figure 3. Monthly and Historical Total Phosphorus Data.

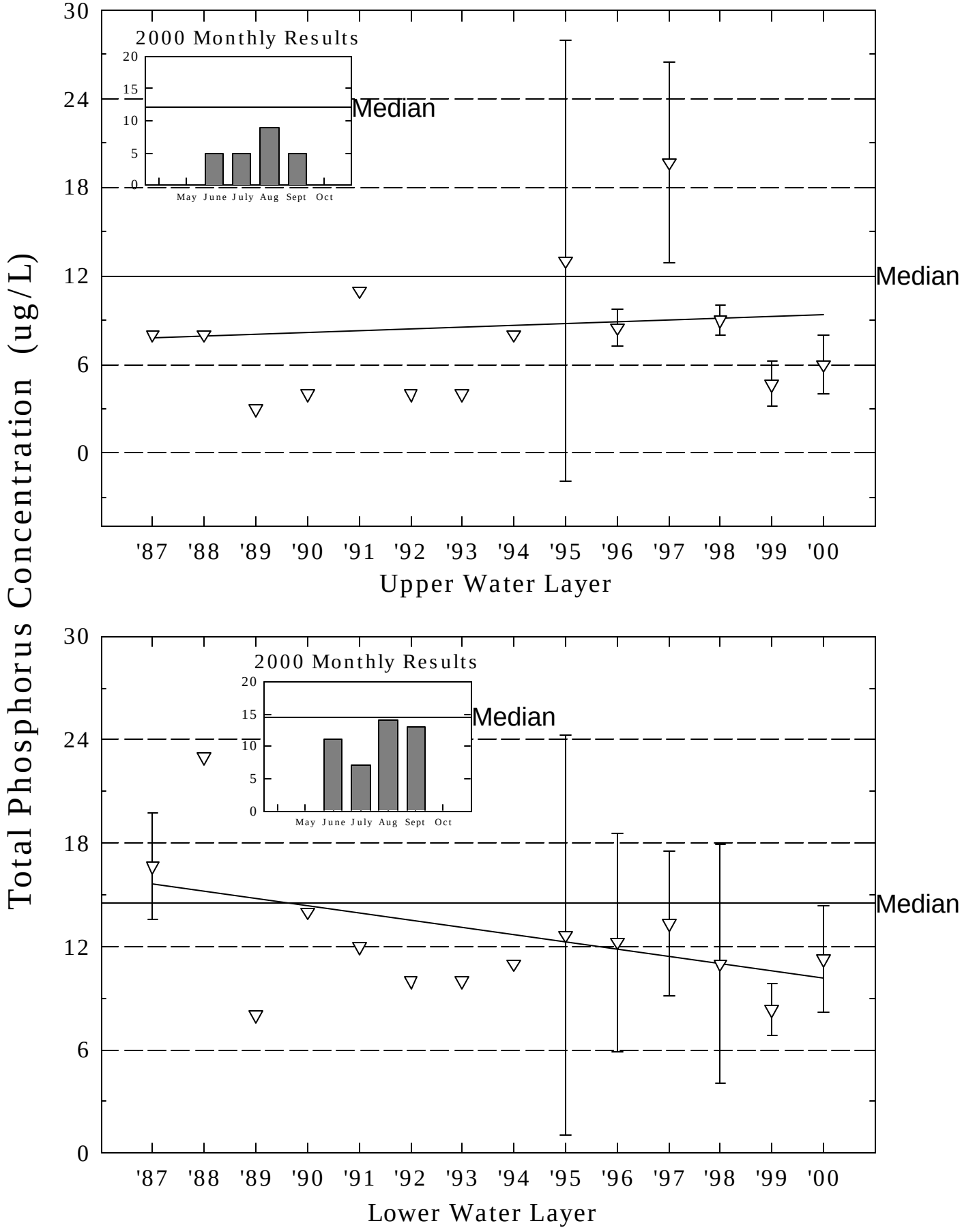


Table 1.

WINONA, LAKE
NEW HAMPTON

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
1986	8.00	8.00	8.00
1987	3.37	13.02	6.86
1988	2.22	2.22	2.22
1989	1.83	1.83	1.83
1990	4.39	4.39	4.39
1991	2.60	6.85	4.44
1992	2.89	7.47	4.39
1993	2.32	2.35	2.33
1994	2.18	2.18	2.18
1995	3.48	6.73	4.74
1996	2.02	7.29	4.66
1997	2.18	2.73	2.54
1998	2.42	6.21	4.28
1999	2.75	4.76	3.78
2000	3.89	4.91	4.45

Table 2.

WINONA, LAKE
NEW HAMPTON

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
01/12/1988	RHIZOSOLENIA	37
	MELOSIRA	33
	ASTERIONELLA	17
07/31/1989	CHRYSOSPHAERELLA	23
	CERATIUM	45
	TABELLARIA	17
08/10/1990	DINOBRYON	46
	CHRYSOSPHAERELLA	30
07/02/1991	SYNURA	28
	CHRYSOSPHAERELLA	24
	TABELLARIA	16
07/21/1992	CERATIUM	30
	ANABAENA	18
	ASTERIONELLA	15
07/15/1993	ASTERIONELLA	34
	CHRYSOSPHAERELLA	33
07/13/1994	RHIZOSOLENIA	45
	DINOBRYON	18
	MALLOMONAS	14
07/06/1995	CHRYSOSPHAERELLA	51
	DINOBRYON	24
	RHIZOSOLENIA	20
07/17/1996	CHRYSOSPHAERELLA	36
	SYNURA	35
	DINOBRYON	16
07/07/1997	ASTERIONELLA	36
	RHIZOSOLENIA	22
	TABELLARIA	17
07/10/1998	SYNURA	42
	CHRYSOSPHAERELLA	31
	DINOBRYON	11

Table 2.

WINONA, LAKE

NEW HAMPTON

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
07/09/1999	ASTERIONELLA	24
	CHRYSOSPHAERELLA	12
	DINOBRYON	12
07/14/2000	DINOBRYON	59
	CHRYSOSPHAERELLA	30
	CERATIUM	5

Table 3.

WINONA, LAKE

NEW HAMPTON

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
1985	5.9	6.7	6.3
1986	5.4	7.0	6.0
1987	5.4	5.7	5.5
1988	5.7	6.7	6.0
1989	5.0	6.1	5.5
1990	4.3	5.5	5.0
1991	5.0	7.0	6.3
1992	3.2	5.6	4.7
1993	5.5	6.7	6.0
1994	5.8	5.8	5.8
1995	4.2	7.2	5.3
1996	4.0	5.9	5.0
1997	5.7	6.0	5.8
1998	3.0	5.1	4.1
1999	4.3	5.5	4.9
2000	4.1	5.2	4.6

Table 4.

WINONA, LAKE

NEW HAMPTON

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1987	7.02	7.02	7.02
	1988	6.42	6.68	6.53
	1989	6.85	6.85	6.85
	1990	6.96	6.96	6.96
	1991	6.96	6.96	6.96
	1992	6.81	6.81	6.81
	1993	6.99	6.99	6.99
	1994	6.66	6.66	6.66
	1995	6.95	7.08	7.00
	1996	6.20	6.62	6.41
	1997	6.56	6.94	6.77
	1998	6.60	6.98	6.80
	1999	6.68	6.82	6.75
	2000	6.80	7.14	6.88
HAWKINS POND INLET				
	1987	6.89	6.89	6.89
	1988	6.60	6.60	6.60
	1989	6.81	6.81	6.81
	1990	6.81	6.81	6.81
	1991	6.91	6.91	6.91
	1992	6.37	6.37	6.37
	1993	6.79	6.79	6.79
	1994	6.15	6.15	6.15
	1995	6.39	6.74	6.53
	1996	6.41	6.74	6.56
	1997	6.58	6.83	6.71

Table 4.

WINONA, LAKE

NEW HAMPTON

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
	1998	6.55	6.86	6.69
	1999	6.60	6.69	6.65
	2000	6.64	6.77	6.70
HEIGHTS BROOK				
	2000	6.24	6.43	6.35
HYPOLIMNION				
	1987	6.05	6.38	6.22
	1988	6.24	6.38	6.30
	1989	6.14	6.14	6.14
	1990	6.18	6.18	6.18
	1991	6.12	6.12	6.12
	1992	5.67	5.67	5.67
	1993	6.18	6.18	6.18
	1994	5.73	5.73	5.73
	1995	6.38	6.50	6.44
	1996	5.88	6.25	6.09
	1997	5.89	6.45	6.10
	1998	6.03	6.18	6.10
	1999	6.16	6.19	6.18
	2000	6.16	6.28	6.21
LITTLE GREEN CABIN				
	1996	6.37	6.37	6.37
METALIMNION				
	1987	6.65	6.90	6.79
	1988	6.60	6.60	6.60

Table 4.

WINONA, LAKE

NEW HAMPTON

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
	1989	6.64	6.64	6.64
	1990	6.62	6.62	6.62
	1991	6.43	6.43	6.43
	1992	6.03	6.03	6.03
	1993	6.63	6.63	6.63
	1994	6.46	6.46	6.46
	1995	6.15	7.09	6.39
	1996	6.08	6.60	6.29
	1997	6.34	6.93	6.49
	1998	5.97	6.93	6.15
	1999	6.21	6.42	6.34
	2000	6.14	6.50	6.28
NORTH INLET				
	1987	6.60	6.60	6.60
	1988	6.51	6.51	6.51
	1989	6.54	6.54	6.54
	1990	6.52	6.52	6.52
	1991	6.75	6.75	6.75
	1992	5.82	5.82	5.82
	1993	6.54	6.72	6.62
	1994	6.13	6.13	6.13
	1995	6.48	6.85	6.61
	1996	6.33	6.72	6.41
	1997	6.21	6.65	6.44
	1998	6.31	6.66	6.46
	1999	6.35	6.51	6.43
	2000	6.19	6.47	6.30

Table 4.

WINONA, LAKE

NEW HAMPTON

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
OUTLET				
	1987	6.77	6.77	6.77
	1988	6.49	6.49	6.49
	1989	6.70	6.70	6.70
	1990	6.86	6.86	6.86
	1991	6.79	6.79	6.79
	1992	6.49	6.49	6.49
	1993	6.74	6.74	6.74
	1994	6.44	6.44	6.44
	1995	6.59	6.65	6.62
	1996	6.56	6.75	6.66
	1997	6.34	6.87	6.58
	1998	6.47	6.81	6.58
	1999	6.38	6.72	6.53
	2000	6.46	6.75	6.61

Table 5.

WINONA, LAKE

NEW HAMPTON

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
1987	5.20	5.20	5.20
1988	6.00	7.90	6.95
1989	5.20	5.20	5.20
1990	4.40	4.40	4.40
1991	6.70	6.70	6.70
1992	5.10	5.10	5.10
1993	6.70	6.70	6.70
1994	6.10	6.10	6.10
1995	5.50	7.00	6.33
1996	4.90	5.30	5.13
1997	5.10	5.50	5.30
1998	4.60	5.70	4.97
1999	5.00	6.00	5.57
2000	4.40	6.10	5.45

Table 6.

WINONA, LAKE
NEW HAMPTON

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1987	46.1	48.3	47.4
	1988	49.9	50.7	50.3
	1989	53.5	53.5	53.5
	1990	54.7	54.7	54.7
	1991	45.6	45.6	45.6
	1992	43.5	43.5	43.5
	1993	47.0	47.0	47.0
	1994	42.8	42.8	42.8
	1995	44.0	46.3	45.3
	1996	42.2	44.4	43.4
	1997	45.5	48.4	47.3
	1998	43.5	52.7	47.1
	1999	59.1	59.7	59.4
	2000	62.1	64.0	63.1
HAWKINS POND INLET				
	1987	67.3	67.3	67.3
	1988	64.0	64.0	64.0
	1989	115.8	115.8	115.8
	1990	61.2	61.2	61.2
	1991	53.3	53.3	53.3
	1992	46.4	46.4	46.4
	1993	61.9	61.9	61.9
	1994	51.1	51.1	51.1
	1995	55.0	64.0	59.5
	1996	46.4	79.7	62.4

Table 6.

WINONA, LAKE
NEW HAMPTON

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
	1997	61.8	68.4	64.6
	1998	51.8	63.6	58.9
	1999	84.7	94.5	89.0
	2000	86.0	92.7	90.2
HEIGHTS BROOK				
	2000	49.5	55.8	52.1
HYPOLIMNION				
	1987	47.7	50.5	48.7
	1988	49.5	52.8	51.1
	1989	53.3	53.3	53.3
	1990	55.8	55.8	55.8
	1991	46.7	46.7	46.7
	1992	42.6	42.6	42.6
	1993	45.8	45.8	45.8
	1994	41.0	41.0	41.0
	1995	44.6	51.7	48.1
	1996	41.9	47.8	45.0
	1997	45.0	51.7	47.5
	1998	52.2	54.7	53.1
	1999	57.9	58.3	58.1
	2000	63.5	70.1	65.5
LITTLE GREEN CABIN				
	1996	56.4	56.4	56.4
METALIMNION				
	1987	44.7	46.3	45.7

Table 6.

WINONA, LAKE
NEW HAMPTON

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
	1988	47.7	47.7	47.7
	1989	51.3	51.3	51.3
	1990	51.8	51.8	51.8
	1991	44.8	44.8	44.8
	1992	40.4	40.4	40.4
	1993	45.5	45.5	45.5
	1994	40.0	40.0	40.0
	1995	42.0	46.0	44.0
	1996	41.0	44.0	42.4
	1997	43.6	51.7	46.8
	1998	44.4	52.0	47.6
	1999	55.9	57.2	56.6
	2000	60.1	63.7	61.9
NORTH INLET				
	1987	54.2	54.2	54.2
	1988	58.2	58.2	58.2
	1989	89.4	89.4	89.4
	1990	46.9	46.9	46.9
	1991	68.0	68.0	68.0
	1992	42.0	42.0	42.0
	1993	74.0	95.0	84.5
	1994	60.0	60.0	60.0
	1995	63.3	76.3	69.8
	1996	37.3	75.0	58.3
	1997	53.8	85.8	70.1
	1998	46.2	71.6	59.7

Table 6.

WINONA, LAKE
NEW HAMPTON

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
	1999	76.8	108.2	91.3
	2000	68.7	100.1	86.3
OUTLET				
	1987	48.0	48.0	48.0
	1988	52.7	52.7	52.7
	1989	54.5	54.5	54.5
	1990	55.1	55.1	55.1
	1991	46.3	46.3	46.3
	1992	43.8	43.8	43.8
	1993	47.1	47.1	47.1
	1994	43.5	43.5	43.5
	1995	43.6	46.8	45.6
	1996	42.1	44.7	43.3
	1997	45.3	47.6	46.7
	1998	45.9	56.3	49.4
	1999	61.4	66.5	63.1
	2000	62.5	67.0	64.2

Table 8.

WINONA, LAKE

NEW HAMPTON

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
1ST BROOK				
	1996	20	20	20
2ND BROOK				
	1996	29	29	29
BEAR POND OUTLET				
	1996	17	17	17
EPILIMNION				
	1987	8	8	8
	1988	6	8	7
	1989	3	3	3
	1990	4	4	4
	1991	11	11	11
	1992	4	4	4
	1993	4	5	4
	1994	8	8	8
	1995	2	30	13
	1996	7	10	8
	1997	12	25	19
	1998	8	10	9
	1999	3	6	4
	2000	< 5	9	6
HAWKINS POND INLET				
	1987	13	13	13
	1988	12	12	12
	1989	12	12	12
	1990	10	10	10

Table 8.

WINONA, LAKE

NEW HAMPTON

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
	1991	12	12	12
	1992	18	18	18
	1993	16	18	17
	1994	19	19	19
	1995	14	47	28
	1996	10	15	13
	1997	18	21	19
	1998	14	16	15
	1999	9	19	14
	2000	7	9	8
HEIGHTS BROOK				
	2000	< 5	14	8
HYPOLIMNION				
	1987	14	20	16
	1988	5	23	14
	1989	8	8	8
	1990	14	14	14
	1991	12	12	12
	1992	10	10	10
	1993	9	10	9
	1994	11	11	11
	1995	5	26	12
	1996	6	21	12
	1997	10	18	13
	1998	7	19	11
	1999	7	10	8

Table 8.

WINONA, LAKE

NEW HAMPTON

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
	2000	7	14	11
LITTLE GREEN CABIN				
	1996	12	12	12
METALIMNION				
	1987	10	17	13
	1988	10	10	10
	1989	8	8	8
	1990	11	11	11
	1991	11	11	11
	1992	10	10	10
	1993	9	10	9
	1994	8	8	8
	1995	4	16	8
	1996	11	12	11
	1997	12	19	16
	1998	6	10	8
	1999	6	11	8
	2000	6	12	8
NORTH INLET				
	1987	16	16	16
	1988	16	16	16
	1989	24	24	24
	1990	12	12	12
	1991	19	19	19
	1992	13	13	13
	1993	13	26	19

Table 8.

WINONA, LAKE

NEW HAMPTON

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
	1994	30	30	30
	1995	26	28	27
	1996	11	19	15
	1997	12	26	21
	1998	6	16	10
	1999	13	33	21
	2000	7	29	18
OUTLET				
	1987	9	9	9
	1988	9	9	9
	1990	2	2	2
	1991	5	5	5
	1992	5	5	5
	1993	5	5	5
	1994	10	10	10
	1995	6	9	7
	1996	6	10	8
	1997	7	10	8
	1998	7	10	8
	1999	4	6	4
	2000	< 5	10	6

Table 9.

WINONA, LAKE

NEW HAMPTON

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
		July 14, 2000	
0.1	22.3	7.3	84.5
1.0	22.3	7.4	85.0
2.0	22.1	7.4	84.8
3.0	21.7	7.5	85.4
4.0	21.1	7.5	84.1
5.0	17.9	8.1	85.8
6.0	13.5	7.6	72.6
7.0	11.4	6.8	62.0
8.0	10.0	5.3	46.6
9.0	9.1	3.7	32.1
10.0	8.7	3.6	31.2
11.0	8.4	1.5	12.9
12.0	8.4	0.4	3.0

Table 10.

WINONA, LAKE

NEW HAMPTON

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
July 2, 1987	13.0	6.0	0.5	4.0
January 12, 1988	12.0	2.0	10.9	78.0
July 31, 1989	12.0	7.5	2.4	20.0
August 10, 1990	12.0	6.6	-0.5	-4.1
July 2, 1991	12.0	6.0	0.5	4.0
July 21, 1992	11.0	6.0	0.5	4.0
July 15, 1993	12.5	6.0	0.6	5.0
July 13, 1994	12.5	8.3	0.1	1.0
July 5, 1995	12.0	8.2	0.3	3.0
July 17, 1996	12.0	7.3	1.7	14.0
July 7, 1997	12.0	8.5	1.1	9.0
July 10, 1998	12.0	6.8	0.3	2.0
July 9, 1999	12.5	8.2	7.8	65.8
July 14, 2000	12.0	8.4	0.4	3.0

Table 11.

WINONA, LAKE
NEW HAMPTON

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1997	0.3	1.4	0.7
	1998	0.4	1.0	0.6
	1999	0.3	0.6	0.4
	2000	0.2	0.4	0.4
HAWKINS POND INLET				
	1997	0.4	0.7	0.6
	1998	0.4	1.1	0.7
	1999	0.8	1.4	1.2
	2000	0.4	0.7	0.6
HEIGHTS BROOK				
	2000	0.1	0.6	0.4
HYPOLIMNION				
	1997	0.5	2.6	1.3
	1998	0.8	8.1	3.2
	1999	0.7	3.1	2.2
	2000	1.0	4.4	2.1
METALIMNION				
	1997	0.4	1.3	0.7
	1998	0.5	1.2	0.7
	1999	0.6	1.3	1.0
	2000	0.5	0.8	0.6
NORTH INLET				
	1997	0.6	3.8	2.2
	1998	0.5	3.7	1.6

Table 11.

WINONA, LAKE
NEW HAMPTON

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
	1999	2.1	6.2	4.1
	2000	0.7	2.8	1.8
OUTLET				
	1997	0.2	1.3	0.6
	1998	0.5	0.8	0.6
	1999	0.4	1.2	0.7
	2000	0.2	0.9	0.5